

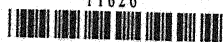
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Agricultural Growth and Rural Development in India

G. P. MISHRA

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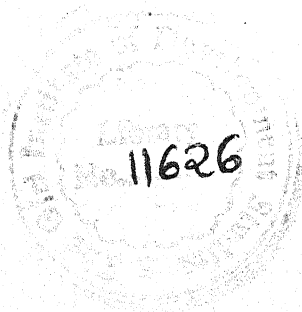
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AGRICULTURAL GROWTH AND RURAL DEVELOPMENT IN INDIA*

G.P. Mishra

This paper makes an attempt to discuss the characteristic behaviour of agricultural growth and relationship between agricultural growth and rural development in India. The concept of rural development is defined on the basis of the following measures : extent or level of rural poverty (i.e. proportion of rural population below poverty line) and inequality and rate of unemployment. It is assumed here that the higher the rate or level of growth in agricultural production, the lower level of poverty and inequality and the unemployment rate. Consequently it is held that there would be more development and prosperity in rural areas.

Rural development and prosperity is not only a function of agricultural growth but also that of anti-poverty programmes as conceived in a package of differential but specific programmes and measures to improve the socio-economic lot of the weaker sections of rural society. Such programmes and measures have been simultaneously launched by the Government since the inception of the Fourth Plan in particular. They are undertaken on the assumption that the fruits of agricultural growth may not trickle down to the weaker sections of the population

*This is a revised version of lecture delivered at ATI, Nainital, September 17-18, 1985.

and so specific programmes and measures to improve their socio-economic lot will directly benefit them. Hence it is also hypothesised here that anti-poverty programmes along the growth in agricultural production have led to reduction in the extent of poverty and inequality and in the rate of unemployment in rural areas.

Characteristic Behaviour of Growth in Agriculture

Indian agriculture has recorded substantial growth during the period of planned development since the inception of the First Five Year Plan. The index number of agricultural production, with triennium ending 1969-70, has increased from about 59 in 1950-51 to about 138 in 1978-79. During this period the index for foodgrain production has risen from 57 to 139 and the index for non-foodgrains has gone up from 62 to 135. Between 1950-51 and 1981-82, foodgrain production has increased from 51 million tons to 133 million tons; sugarcane from 57 million tons to 184 tons; cotton from 30 lakh bales to 78 lakh bales; and the production of five major oil-seeds from 52 lakh tons to 108 lakh tons. These increases are quite significant from the point of view of growth in Indian agriculture.

The process of agricultural growth shows that during 1951-52 to 1981-82 foodgrain production has increased at the rate of 5 per cent per annum and the yield of foodgrains has gone up at the rate of a little more 3 per cent per annum. If the whole period is divided into pre-HYV and post-HYV era (i.e.

Table 1 : Production, Area and Yield of Foodgrains
and Rate of Increase

Period	Production (in million tons)	Area (in million hectares)	Yield per Hectare (in Kgs.)
1951-52	52	97	536
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1963-64	81	117	687
1964-65	89	118	757

Percentage rate of increase per annum during 1951-52 to 1964-65

5.00 1.67 3.00

1967-68	95	121	783
1968-69	94	120	781
1969-70	100	124	805
1970-71	108	124	872
1971-72	105	123	858
1972-73	97	119	813
1973-74	105	127	827
1974-75	100	121	824
1975-76	121	126	944
1976-77	111	124	894
1977-78	126	127	991
1978-79	132	129	1023
1979-80	110	125	879
1980-81	130	127	1023
1981-82	133	129	1033

Percentage rate of increase per annum during 1967-68 to 81-82

4.44 0.46 2.30

Note : The years, 1965-66 and 1966-67 are not taken into account due to being abnormal years.

1951-52 to 1964-65 and 1967-68 to 1981-82 respectively), the following characteristics may be noted : firstly, during pre-HYV era the yield and production levels of foodgrains had been fluctuating without retaining any reasonable level of stability; while during post-HYV era, there had been growth with certain amount of stability. Secondly, during the former period extensive area based approach to agriculture by and large accounted for the growth in foodgrain production; but during post-HYV era, the adoption of new farm technology as a package of modern inputs and practices accounted for the growth in foodgrain production in Indian agriculture. Table 2 shows how agriculture responded to the use of modern inputs leading to growth in

Table 2 : Use of Modern Inputs

	1950- 51	1955- 56	1975- 76	1978- 79
1. Per cent of net area irrigated	17.6	19.3	24.2	26.3
2. Fertilizer consumption per hectare of gross cropped area (GCA) in Kgs.	0.5	5.1	17.4	29.4
3. Area under HYV (per cent)	-	-	3.7	27.0
4. Tractors per lakh hectares of GCA	7	14	166	234
5. Oil Engines per hectares of GCA	62	295	1074	-
6. Irrigation pumpsets with Tube-wells per hectare of GCA	16	126	1617	2308
7. Power consumption in KWH per thousand hectares of GCA	1.5	12.2	50.0	76.9

Source : Omvedt, 1981.

yield and production during the post-HYV period. This era also experienced some growth in private investment in agriculture, so far the use of tubewells and energised pumpsets is concerned. In 1977, the total number of energised pumpsets and four-wheel tractors were about 48 lakhs and 28 lakhs respectively.

Regional Aspects of Agricultural Growth

The process of growth has not been spatially uniform in Indian agriculture. It varies from one region to another and one area to another within a given region. There have been spatial variations in the rates and levels of agricultural growth because the development structure of Indian agriculture is not uniformly grown and diffused at inter-regional or intra-regional level. The spatial variations in the development structure of agriculture have been continuing since the colonial days. There are many studies on the regional dimension of agricultural growth which bear evidence to this fact.

An inter-state picture about growth rates and development levels (shown in terms of irrigated area, fertilizer consumption, credit and use of mechanical power) presented in Table 3 indicates that inter-state variations in growth rates roughly correspond to the inter-state variations in the levels of development. In his paper, V. Nath (1970) has come to the conclusion that the co-efficients of correlation of productivity increase rate with extent of irrigation, index of moisture

availability and index of yield per hectare being insignificant testify to this fact that growth rates are primarily related to the levels of development in agriculture. The States of Gujarat, Tamil Nadu, Punjab and Haryana having high productivity and output growth rates have also relatively higher level of development in their respective agriculture.

Table 3 : Growth of Agricultural Output and Productivity and Data on Variables Affecting Productivity

States	Compound Growth Rate (in per cent) Productivity	Output	Irrigated area (per cent)	Fertilizer consumption	Use of mechanical power	Loan per hectare
1	2	3	4	5	6	7
1. Gujarat	4.09	4.55	7.8	2.3	5.7	33.8
2. Tamil Nadu	3.04	4.17	45.2	11.0	18.9	56.3
3. Mysore	2.71	3.53	9.2	3.1	2.3	14.3
4. Punjab & Haryana	2.61	4.56	42.2	3.4	3.4	19.2
5. Maharashtra	2.45	2.93	6.7	2.3	3.9	30.2
6. Andhra Pradesh	2.45	2.73	29.5	8.6	4.6	21.3
7. Bihar	2.25	2.97	19.9	2.4	0.7	9.7
8. Orissa	1.66	2.48	16.4	1.0	0.3	8.3
9. West Bengal	1.34	1.94	21.5	3.3	0.7	10.1
10. Madhya Pradesh	1.21	2.49	5.6	0.9	0.9	13.7
11. Kerala	0.96	2.27	21.0	9.4	2.8	42.7
12. U.P.	0.94	1.66	26.6	2.2	1.2	22.2
13. Assam	(-) 0.08	1.77	23.3	0.3	0.4	0.6
14. Rajasthan	(-) 0.11	2.74	12.5	0.5	0.7	3.6
INDIA	1.77	3.01	18.9	3.1	2.6	19.5

Source : Nath, V, (1970).

Notes : Col.(5) refers to Kgs. per hectare; Col.(6) to units per thousand hectares of gross sown area and col.(7) to cooperative loans advanced by primary cooperative societies (in terms of Rs.). All these refer to 1962-63.

Co-efficients of variation between

- (a) rate of productivity increase and p.c. of gross area irrigated 0.09
- (b) rate of productivity increase and index of moisture availability (-) 0.39
- (c) rate of productivity increase and index of yield per hectare (1956-57) 0.18

The structure of development built into Indian agriculture over a period of time is not only spatially uneven but also its social intercourse into the process of growth, that is to say, the responsiveness of farmers to the use of that structure in the process of farm production is also different in different States or in different areas within a given State. As result, the States that show relatively a high level of development structure do not yield correspondingly a relative high rate of growth. Such a deviation may be observed in some States on the basis of Table 3.

So far the post-HYV era is concerned, it may be found that States having high growth rates and development levels have continued to retain their relative positions, except in case of a few States who have recently appeared in the group of development or semi-developed States because of improvements in the development structure of their respective agriculture.

Tables 4 & 5 show that the States of Punjab, Haryana and Tamil Nadu have development index above the National average in both periods, 1970-71 and 1980-81; and the other developed State, i.e. Gujrat being developed before the HYV Era, has the index around the national average. Uttar Pradesh retained its position in the developed group in 1970-71 as well as in 1980-81. Andhra Pradesh, Jammu and Kashmir and Karnataka have maintained their respective positions around the national average. If the position of U.P. placed on the basis of development index and compared with productivity index, it is found to be near the national average falling in second category. This

Table 4 : Ranking and Classification of States on
Development Index

1980-81			1970-71		
Group	States order		Group	States order	
<u>A. (Above 110)</u>	Punjab	295.32	<u>A. (Above 110)</u>	Punjab	332.08
	Haryana	197.69		Tamil- nadu	227.00
	Tamilnadu	171.32		Kerala	226.00
	U.P.	134.24		Haryana	170.16
	Kerala	124.07		U.P.	132.67
<u>B. (90-110)</u>	A.P.	109.11	<u>B. (90-110)</u>	J. & K.	109.93
	Karnataka	96.25		Gujarat	98.03
	Gujarat	90.56		A.P.	97.61
	J & K	90.31			
<u>C. (Below 90)</u>	Bihar	83.51	<u>C. (Below 90)</u>	West	
	Maharashtra	79.82		Bengal	86.90
	West Bengal	76.54		Bihar	85.44
	Himachal Pradesh	72.69		Karnataka	83.40
	Rajasthan	63.08		Maharash- tra	73.74
	Orissa	55.64		Orissa	63.74
	M.P.	54.55		Assam	60.58
	Assam	53.49		Rajasthan	56.73
				M.P.	45.87
Coefficient of Variation (in per cent)			Co-efficient of Varia- tion (in per cent)		
56.02			62.46		

Table 5 : Ranking and Classification of States Based
on Productivity Index

1970-71		1980-81	
Group	States order	Group	States order
<u>A. (Above 110)</u>	Punjab 176.36	<u>A. (Above 110)</u>	Punjab 171.74
	Tamilnadu 162.70		Haryana 159.44
	J. & K. 131.67		Tamilnadu 139.19
	Haryana 125.50		J. & K. 138.18
	Kerala 120.85		Karnataka 114.90
			A.P. 113.72
			Gujarat 112.90
<u>B. (90 - 110)</u>	West Bengal 109.92	<u>B. (90-110)</u>	West Bengal 108.84
	U.P. 106.87		Bihar 105.08
	H.P. 106.43		Kerala 104.34
	Orissa 103.89		U.P. 98.53
	Karnataka 103.86		
	A.P. 103.59		
	Assam 99.63		
	Gujarat 99.51		
	Bihar 93.39		
<u>C. (Below 90)</u>	M.P. 88.54	<u>C. (Below 90)</u>	Assam 86.92
	Rajasthan 64.42		Maharashtra 86.89
	Maharashtra 57.71		H.P. 85.80
			M.P. 74.46
			Rajasthan 62.63
Coefficient of Variation 26.22		Coefficient of variation 25.43	

indicates that despite being developed, this state has not experienced a high rate of growth. Table 6 indicates that the rate of growth in U.P. is below all India growth rate level. But the States of Gujarat, Punjab and Haryana have continued to maintain their relative positions in respect of growth.

Table 6 : Compound Rates of Growth of Foodgrain Production: Classification of States (Period : 1968-69 to 1980-81)

Group : A

Growth Rate of 2.48 and above

Andhra Pradesh, Gujarat, Haryana, Punjab and Maharashtra.

Group : B

Growth Rate between 2.48 and 2.24

Karnataka

Group : C

Growth Rate 2.00 and below

All the rest

Note : This classification is made on the basis of compound rates given in 'Hypothesis of Deceleration in Indian Agriculture', by S.B. Samant, in Indian Journal of Agricultural Economics, October-December 1983.

Maharashtra and Andhra Pradesh have done quite well, despite having relatively lower development index. Karnataka is not as developed as the first three States but has fared quite well in respect of growth; but on the contrary, U.P. being in the first group (based on development index) has experienced only 1.99 per cent growth rate. Such differences in fact arise from the

existence of relatively low level of responsiveness on the part of the farmers to use development structure in the process of farm production.

However, the inter-State coefficients of variations in development index and productivity index at two points of time, i.e. 1970-71 and 1980-81, indicate dispersion of development and growth in Indian agriculture. The process of dispersion can be made more effective, if the productive forces grow and develop more widely in Indian agriculture.

Agricultural Growth and Rural Development

The process of agricultural growth is supposed to bring about rural development by raising income per head of rural population and working population, by creating income generating assets per household, by raising self-employment and wage labour employment and by reducing the extent of rural poverty and inequality. The impact of agricultural growth that the Indian economy has experienced during the last three decades since the inception of the First Plan is discussed on the following measures : extent of rural poverty, unemployment rates, value of assets per household and concentration ratio for asset holding.

So far the relationship between rural poverty and agricultural growth is concerned, studies by Ahluwalia (1977) and Pradhan H. Prasad (1985) empirically observed that growth in foodgrain production was significantly negatively related to

the extent of rural poverty. That is to say, the higher the rate of growth in foodgrain output, the smaller the proportion of rural population below the poverty line. Sudipto Mandal's study (1985) did not find the relation consistent at the inter-state level. But Griffin (1979) and VG Rao and GP Mishra (1981) did not observe such relationship. The latter observation is based on the fact that without change in the pattern of income distribution in favour of the rural poor, a mere growth in agricultural output cannot reduce the extent of poverty in rural areas. The figures given in Table 7 show that the extent of rural poverty is as high as about 48 per cent. The inter-state extent of rural poverty indicates some marginal decline in it even relating to Punjab and Haryana which are taken to be agriculturally most developed in the country. The States like Gujarat, Karnataka, Tamil Nadu and U.P. which are assumed to be developed ones have the extent of poverty varying from 36 per cent in Gujarat to 48 per cent in Tamil Nadu in 1973-74. In 1977-78, the extent of rural poverty increased from about 48 per cent in 1973-74 to about 52 per cent in 1977-78. There has been increase in most of the States, except in case of a few studies like Bihar, Kerala and West Bengal. However, the latter States show high level of poverty.

The relationship between agricultural growth and rural employment is assumed to be positively correlated because the former creates both, self-employment and wage employment. Hence the unemployment rates should decrease along growth in agri-

Table 7 : Indicators of Rural Development

S T A T E S	EMPLOYMENT RATES		POVERTY		Value of per house- hold (in Rs.) (1971-72)	Gini Co- effici- ent for Asset holding (1971-72)
	1973- 74	1977- 78	1973- 74	1977- 78		
1	2	3	4	5	6	7
1. Andhra Pradesh	12.00	10.77	39.8	45.6	8080	0.703
2. Assam	1.79	1.55	39.8	49.5	7832	-
3. Bihar	10.59	8.17	58.4	56.8	12827	0.672
4. Gujarat	5.84	6.14	35.6	43.1	12824	0.632
5. Haryana	3.78	6.83	-	23.0	27138	0.629
6. Jammu & Kashmir	8.51	5.76	-	-	15259	-
7. Karnataka	9.89	9.32	46.9	53.0	10031	0.655
8. Kerala	26.25	26.94	49.3	46.0	11615	0.661
9. Madhya Pradesh	3.45	2.74	52.3	60.9	10520	0.589
10 Maharashtra	9.96	7.37	49.8	57.0	11682	0.649
11 Orissa	10.69	8.19	58.0	66.9	6023	0.578
12 Punjab	4.45	4.88	23.0	13.0	31833	0.682
13 Rajasthan	3.87	3.07	29.8	31.8	12753	0.559
14 Tamil Nadu	13.17	16.60	48.3	56.0	6826	0.711
15 U.P.	3.64	3.97	47.3	49.3	13531	0.592
16 West Bengal	11.27	9.75	66.0	57.7	7330	0.660
ALL INDIA	8.49	8.11	47.6	50.7	11310	0.635

Sources : Cols. (2 & 3) refer to NSS 27th Round : 1972-73 and 32 Round, 1977-78 (Age group 15-59).

Cols. (4 & 5), Ahluwalia (1977) and VN Misra (1985).

Cols. (6 & 7), Ashoka Mody (1985).

culture. Studies on the impact of growth on rural employment indicate that Indian agriculture still absorbs a major part of labour force and the employment elasticity relating to output being low indicates the existence of a large part of work force as underemployed in agriculture. The rates of rural unemployment being more or less the same as 8.49 per cent in 1972-73 and 8.11 per cent in 1977-78 refer to quite marginal improvement in employment in rural areas. The inter-state unemployment rates do not also present significant improvement in the situation of rural employment. In most of the States appeared in developed or semi-developed category, in terms of either development index or growth rates, show not only relatively high rates of unemployment but also refer to increase in the rates from 1972-73 to 1977-78.

The figures about the value of assets per household as given in Table 7 also tell the same story, so far the impact of agricultural growth on asset holding is concerned. Most of the developed States as appeared in the foregoing section show to have higher value of assets per household than that belonging to agriculturally backward States. They have also high concentration ratio. H. Laxaminarayana's study (1979) shows that 'variation in assets per hectare across the States is directly related to variations in yield per hectare. This implies that the States having higher levels or rates of productivity increase have created more assets per hectare. The farm size-wise distribution of assets per hectare (and also

per household) across the States indicates that the farm households with large holdings have more assets than the other households. Thus inegalitarian pattern of land ownership and assets holding has favoured the process of growth and development in the interests of big farmers than in those of poor and unemployed in rural areas.

Conclusion

The process of growth in Indian agriculture was by and large fluctuating without retaining any reasonable level of stability in foodgrain productivity till 1964-65. But with the introduction of New Farm Technology since the mid-sixties, it presents a picture of growth with certain amount of stability in production. An overall picture presents a scene of relief in respect of growth in agricultural production.

But this process of growth has not been spatially uniform in Indian agriculture, as inter-state level of development and growth shows. The inter-state variations in the level of development and growth exist mostly due to inter-state differences in the development level of productive forces and in the degree of farmer's responsiveness to use these forces in the process of agricultural production.

Agricultural growth and anti-poverty programmes are supposed to bring about prosperity and progress in rural areas. But the extent of rural poverty, inequality level and unemployment rate indicate that agricultural growth and anti-poverty programmes

made
have little dent on the reduction of poverty, inequality and unemployment in rural areas. One may have this conclusion because of the existence highly skewed pattern of distribution of land and other material assets in rural India. Moreover, it becomes more difficult when the State functions in collusion with bureaucracy and rural oligarch in the absence of viable grass-root democratic institutions.

Appendix

Development Index (DI) is constructed as follows :

$$G.I. = \frac{\sum r_{yi} \cdot F_{ij}}{\sum r_{yi}} \times 100$$

Where :

G.I., is development index of i^{th} state;

r_{yi} is coefficient of correlation between yield at i^{th} indicator (variable); and,

F_{ij} is the ratio of i^{th} indicator in j^{th} state to national average

While constructing the above index, the following variables are into account :

1. Fertilizer consumption Kgs. per hectare
2. Area under HYV as per cent of total cropped area
3. Gross irrigated area as per cent of gross sown area
4. Number of tubewells per 1000 hectares of net sown area
5. Number of tractors per 10,000 hectares of net sown area
6. Cropping intensity
7. Net sown area as per cent of reporting area
8. Rural literacy rate
9. Area under commercial crops as per cent of gross sown area
10. Percentage of holding in less than 2 hectares
11. Percentage of area under less than 2 hectares
12. Number of scheduled commercial banks in rural areas as per cent of villages
13. Percentage of cultivators as members in cooperative societies to total cultivators

Productivity Index is constructed as follows :

$$G.I.j = \frac{\sum y_{ij} C_{ij}}{\sum C_{ij}} \times 100$$

Where,

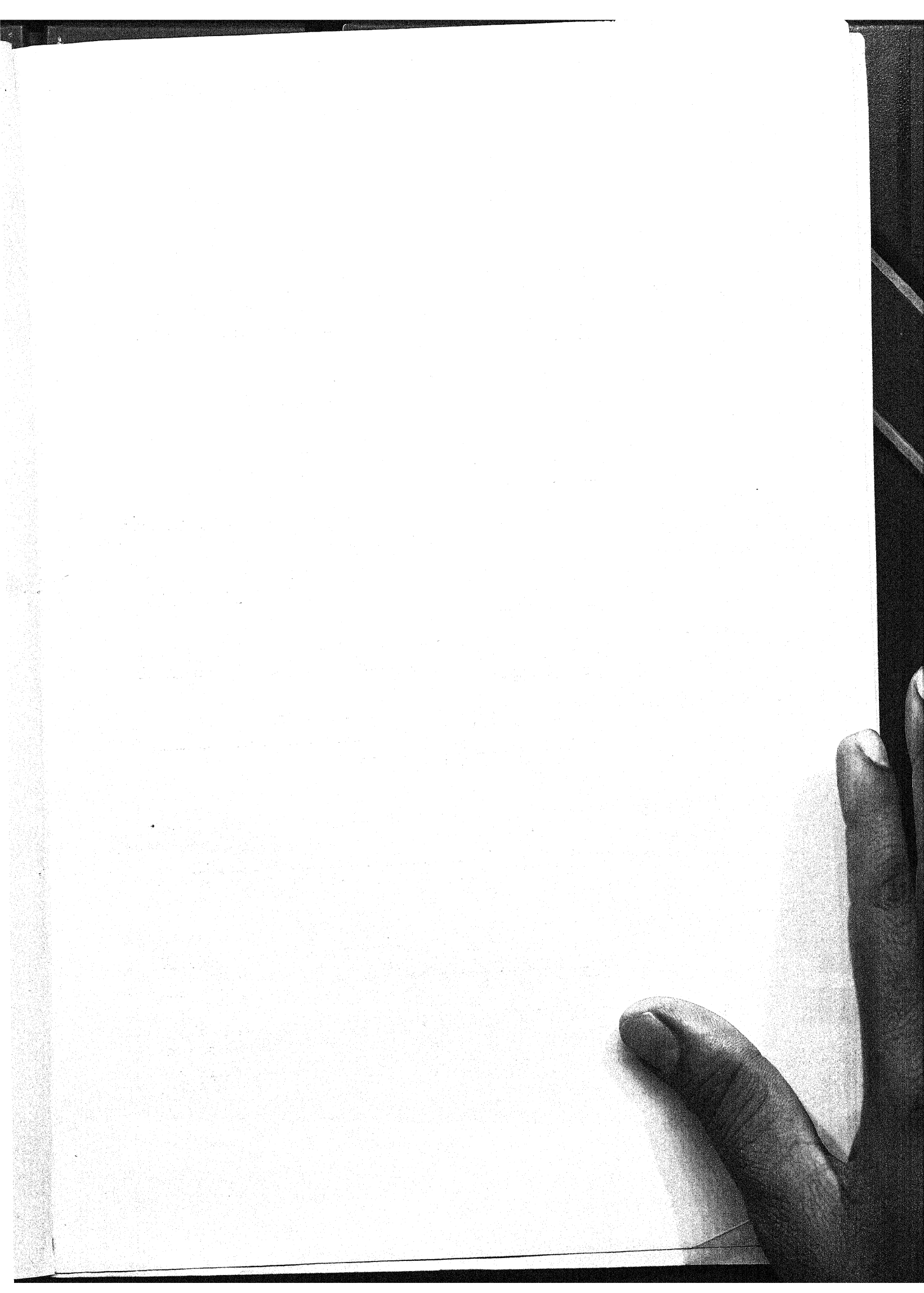
G.I. is composite index of state j ;

C_{ij} is proportion of area under i^{th} crop to total cropped area in j^{th} state; and,

$Y_{ij} = \frac{E_{ij}}{E_i}$ where E_{ij} is the yield of i^{th} crop in j^{th} state and E_i is the yield of i^{th} crop in the country as a whole.

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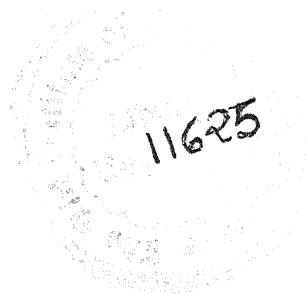
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1964-65	89	118	757

Percentage rate of increase per annum during 1951-52 to 1964-65

	5.00	1.67	3.00
1967-68	95	121	783
1968-69	94	120	781
1969-70	100	124	805
1970-71	108	124	872
1971-72	105	123	858
1972-73	97	119	813
1973-74	105	127	827
1974-75	100	121	824
1975-76	121	126	944
1976-77	111	124	894
1977-78	126	127	991
1978-79	132	129	1023
1979-80	110	125	879
1980-81	130	127	1023
1981-82	133	129	1033

Percentage rate of increase per annum during 1967-68 to 81-82

	4.44	0.46	2.30
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Note : The years, 1965-66 and 1966-67 are not taken into account due to being abnormal years.

1951-52 to 1964-65 and 1967-68 to 1981-82 respectively), the following characteristics may be noted : firstly, during pre-HYV era the yield and production levels of foodgrains had been fluctuating without retaining any reasonable level of stability; while during post-HYV era, there had been growth with certain amount of stability. Secondly, during the former period extensive area based approach to agriculture by and large accounted for the growth in foodgrain production; but during post-HYV era, the adoption of new farm technology as a package of modern inputs and practices accounted for the growth in foodgrain production in Indian agriculture. Table 2 shows how agriculture responded to the use of modern inputs leading to growth in

Table 2 : Use of Modern Inputs

	1950- 51	1955- 56	1975- 76	1978- 79
1. Per cent of net area irrigated	17.6	19.3	24.2	26.3
2. Fertilizer consumption per hectare of gross cropped area (GCA) in Kgs.	0.5	5.1	17.4	29.4
3. Area under HYV (per cent)	-	-	3.7	27.0
4. Tractors per lakh hectares of GCA	7	14	166	234
5. Oil Engines per hectares of GCA	62	295	1074	-
6. Irrigation pumpsets with Tube-wells per hectare of GCA	16	126	1617	2308
7. Power consumption in KWH per thousand hectares of GCA	1.5	12.2	50.0	76.9

Source : Omvedt, 1981.

yield and production during the post-HYV period. This era also experienced some growth in private investment in agriculture, so far the use of tubewells and energised pumpsets is concerned. In 1977, the total number of energised pumpsets and four-wheel tractors were about 48 lakhs and 28 lakhs respectively.

Regional Aspects of Agricultural Growth

The process of growth has not been spatially uniform in Indian agriculture. It varies from one region to another and one area to another within a given region. There have been spatial variations in the rates and levels of agricultural growth because the development structure of Indian agriculture is not uniformly grown and diffused at inter-regional or intra-regional level. The spatial variations in the development structure of agriculture have been continuing since the colonial days. There are many studies on the regional dimension of agricultural growth which bear evidence to this fact.

An inter-state picture about growth rates and development levels (shown in terms of irrigated area, fertilizer consumption, credit and use of mechanical power) presented in Table 3 indicates that inter-state variations in growth rates roughly correspond to the inter-state variations in the levels of development. In his paper, V. Nath (1970) has come to the conclusion that the co-efficients of correlation of productivity increase rate with extent of irrigation, index of moisture

availability and index of yield per hectare being insignificant testify to this fact that growth rates are primarily related to the levels of development in agriculture. The States of Gujarat, Tamil Nadu, Punjab and Haryana having high productivity and output growth rates have also relatively higher level of development in their respective agriculture.

Table 3 : Growth of Agricultural Output and Productivity and Data on Variables Affecting Productivity

States	Compound Growth Rate (in per cent)		Irrigated area (per cent)	Fertilizer consumption	Use of mechanical power	Loan per hectare
1	2	3	4	5	6	7
1. Gujarat	4.09	4.55	7.8	2.3	5.7	33.8
2. Tamil Nadu	3.04	4.17	45.2	11.0	18.9	56.3
3. Mysore	2.71	3.53	9.2	3.1	2.3	14.3
4. Punjab & Haryana	2.61	4.56	42.2	3.4	3.4	19.2
5. Maharashtra	2.45	2.93	6.7	2.3	3.9	30.2
6. Andhra Pradesh	2.45	2.73	29.5	8.6	4.6	21.3
7. Bihar	2.25	2.97	19.9	2.4	0.7	9.7
8. Orissa	1.66	2.48	16.4	1.0	0.3	8.3
9. West Bengal	1.34	1.94	21.5	3.3	0.7	10.1
10. Madhya Pradesh	1.21	2.49	5.6	0.9	0.9	13.7
11. Kerala	0.96	2.27	21.0	9.4	2.8	42.7
12. U.P.	0.94	1.66	26.6	2.2	1.2	22.2
13. Assam	(-)0.08	1.77	23.3	0.3	0.4	0.6
14. Rajasthan	(-)0.11	2.74	12.5	0.5	0.7	3.6
INDIA	1.77	3.01	18.9	3.1	2.6	19.5

Source : Nath, V, (1970).

Notes : Col.(5) refers to Kgs. per hectare; Col.(6) to units per thousand hectares of gross sown area and col.(7) to cooperative loans advanced by primary cooperative societies (in terms of Rs.). All these refer to 1962-63.

Co. efficient of variation between

- (a) rate of productivity increase and p.c. of gross area irrigated 0.09
- (b) rate of productivity increase and index of moisture availability (-)0.39
- (c) rate of productivity increase and index of yield per hectare (1956-57) 0.18

The structure of development built into Indian agriculture over a period of time is not only spatially uneven but also its social intercourse into the process of growth, that is to say, the responsiveness of farmers to the use of that structure in the process of farm production is also different in different States or in different areas within a given State. As result, the States that show relatively a high level of development structure do not yield correspondingly a relative high rate of growth. Such a deviation may be observed in some States on the basis of Table 3.

So far the post-HYV era is concerned, it may be found that States having high growth rates and development levels have continued to retain their relative positions, except in case of a few States who have recently appeared in the group of development or semi-developed States because of improvements in the development structure of their respective agriculture.

Tables 4 & 5 show that the States of Punjab, Haryana and Tamil Nadu have development index above the National average in both periods, 1970-71 and 1980-81; and the other developed State, i.e. Gujrat being developed before the HYV Era, has the index around the national average. Uttar Pradesh retained its position in the developed group in 1970-71 as well as in 1980-81. Andhra Pradesh, Jammu and Kashmir and Karnataka have maintained their respective positions around the national average. If the position of U.P. placed on the basis of development index and compared with productivity index, it is found to be near the national average falling in second category. This

Table 4 : Ranking and Classification of States on
Development Index

Group	1980-81		Group	1970-71	
	States order			States order	
<u>A. (Above 110)</u>	Punjab	295.32	<u>A. (Above 110)</u>	Punjab	332.08
	Haryana	197.69		Tamil- nadu	227.00
	Tamilnadu	171.32		Kerala	226.00
	U.P.	134.24		Haryana	170.16
	Kerala	124.07		U.P.	132.67
<u>B. (90-110)</u>	A.P.	109.11	<u>B. (90-110)</u>	J. & K.	109.93
	Karnataka	96.25		Gujarat	98.03
	Gujarat	90.56		A.P.	97.61
	J & K	90.31			
<u>C. (Below 90)</u>	Bihar	83.51	<u>C. (Below 90)</u>	West Bengal	86.90
	Maharashtra	79.82		Bihar	85.44
	West Bengal	76.54		Karnataka	83.40
	Himachal Pradesh	72.69		Maharash- tra	73.74
	Rajasthan	63.08		Orissa	63.74
	Orissa	55.64		Assam	60.58
	M.P.	54.55		Rajasthan	56.73
	Assam	53.49		M.P.	45.87
Coefficient of Variation (in per cent)		56.02	Co-efficient of Varia- tion (in per cent)		62.46

Table 5 : Ranking and Classification of States Based
on Productivity Index

1970-71		1980-81	
Group	States order	Group	States order
<u>A. (Above 110)</u>	Punjab 176.36	<u>A. (Above 110)</u>	Punjab 171.74
	Tamilnadu 162.70		Haryana 159.44
	J. & K. 131.67		Tamilnadu 139.19
	Haryana 125.50		J. & K. 138.18
	Kerala 120.85		Karnataka 114.90
			A.P. 113.72
			Gujarat 112.90
<u>B. (90 - 110)</u>	West Bengal 109.92	<u>B. (90-110)</u>	West Bengal 108.84
	U.P. 106.87		Bihar 105.08
	H.P. 106.43		Kerala 104.34
	Orissa 103.89		U.P. 98.53
	Karnataka 103.86		
	A.P. 103.59		
	Assam 99.63		
	Gujarat 99.51		
	Bihar 93.39		
<u>C. (Below 90)</u>	M.P. 88.54	<u>C. (Below 90)</u>	Assam 86.92
	Rajasthan 64.42		Maharashtra 86.89
	Maharashtra 57.71		H.P. 85.80
			M.P. 74.46
			Rajasthan 62.63
Coefficient of Variation 26.22		Coefficient of variation 25.43	

indicates that despite being developed, this state has not experienced a high rate of growth. Table 6 indicates that the rate of growth in U.P. is below all India growth rate level. But the States of Gujarat, Punjab and Haryana have continued to maintain their relative positions in respect of growth.

Table 6 : Compound Rates of Growth of Foodgrain Production: Classification of States (Period : 1968-69 to 1980-81)

Group : A

Growth Rate of 2.48 and above	Andhra Pradesh, Gujarat, Haryana, Punjab and Maharashtra.
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Group : B

Growth Rate between 2.48 and 2.24	Karnataka
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Group : C

Growth Rate 2.00 and below	All the rest
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Note : This classification is made on the basis of compound rates given in 'Hypothesis of Deceleration in Indian Agriculture', by S.B. Samant, in Indian Journal of Agricultural Economics, October-December 1983.

Maharashtra and Andhra Pradesh have done quite well, despite having relatively lower development index. Karnataka is not as developed as the first three States but has fared quite well in respect of growth; but on the contrary, U.P. being in the first group (based on development index) has experienced only 1.99 per cent growth rate. Such differences in fact arise from the

existence of relatively low level of responsiveness on the part of the farmers to use development structure in the process of farm production.

However, the inter-State coefficients of variations in development index and productivity index at two points of time, i.e. 1970-71 and 1980-81, indicate dispersion of development and growth in Indian agriculture. The process of dispersion can be made more effective, if the productive forces grow and develop more widely in Indian agriculture.

Agricultural Growth and Rural Development

The process of agricultural growth is supposed to bring about rural development by raising income per head of rural population and working population, by creating income generating assets per household, by raising self-employment and wage labour employment and by reducing the extent of rural poverty and inequality. The impact of agricultural growth that the Indian economy has experienced during the last three decades since the inception of the First Plan is discussed on the following measures : extent of rural poverty, unemployment rates, value of assets per household and concentration ratio for asset holding.

So far the relationship between rural poverty and agricultural growth is concerned, studies by Ahluwalia (1977) and Pradhan H. Prasad (1985) empirically observed that growth in foodgrain production was significantly negatively related to

the extent of rural poverty. That is to say, the higher the rate of growth in foodgrain output, the smaller the proportion of rural population below the poverty line. Sudipto Mandal's study (1985) did not find the relation consistent at the inter-state level. But Griffin (1979) and VG Rao and GP Mishra (1981) did not observe such relationship. The latter observation is based on the fact that without change in the pattern of income distribution in favour of the rural poor, a mere growth in agricultural output cannot reduce the extent of poverty in rural areas. The figures given in Table 7 show that the extent of rural poverty is as high as about 48 per cent. The inter-state extent of rural poverty indicates some marginal decline in it even relating to Punjab and Haryana which are taken to be agriculturally most developed in the country. The States like Gujarat, Karnataka, Tamil Nadu and U.P. which are assumed to be developed ones have the extent of poverty varying from 36 per cent in Gujarat to 48 per cent in Tamil Nadu in 1973-74. In 1977-78, the extent of rural poverty increased from about 48 per cent in 1973-74 to about 52 per cent in 1977-78. There has been increase in most of the States, except in case of a few studies like Bihar, Kerala and West Bengal. However, the latter States show high level of poverty.

The relationship between agricultural growth and rural employment is assumed to be positively correlated because the former creates both, self-employment and wage employment. Hence the unemployment rates should decrease along growth in agri-

Table 7 : Indicators of Rural Development

S T A T E S	EMPLOYMENT RATES		POVERTY		Value of per house- hold (in Rs.) (1971-72)	Gini Co- effici- ent for Asset holding (1971-72)
	1973- 74	1977- 78	1973- 74	1977- 78		
1	2	3	4	5	6	7
1. Andhra Pradesh	12.00	10.77	39.8	45.6	8080	0.703
2. Assam	1.79	1.55	39.8	49.5	7832	-
3. Bihar	10.59	8.17	58.4	56.8	12827	0.672
4. Gujarat	5.84	6.14	35.6	43.1	12824	0.632
5. Haryana	3.78	6.83	-	23.0	27138	0.629
6. Jammu & Kashmir	8.51	5.76	-	-	15259	-
7. Karnataka	9.89	9.32	46.9	53.0	10031	0.655
8. Kerala	26.25	26.94	49.3	46.0	11615	0.661
9. Madhya Pradesh	3.45	2.74	52.3	60.9	10520	0.589
10 Maharashtra	9.96	7.37	49.8	57.0	11682	0.649
11 Orissa	10.69	8.19	58.0	66.9	6023	0.578
12 Punjab	4.45	4.88	23.0	13.0	31833	0.682
13 Rajasthan	3.87	3.07	29.8	31.8	12753	0.559
14 Tamil Nadu	13.17	16.60	48.3	56.0	6826	0.711
15 U.P.	3.64	3.97	47.3	49.3	13531	0.592
16 West Bengal	11.27	9.75	66.0	57.7	7330	0.660
ALL INDIA	8.49	8.11	47.6	50.7	11310	0.635

Sources : Cols. (2 & 3) refer to NSS 27th Round : 1972-73 and 32 Round, 1977-78 (Age group 15-59).

Cols. (4 & 5), Ahluwalia (1977) and VN Misra (1985).

Cols. (6 & 7), Ashoka Mody (1985).

culture. Studies on the impact of growth on rural employment indicate that Indian agriculture still absorbs a major part of labour force and the employment elasticity relating to output being low indicates the existence of a large part of work force as underemployed in agriculture. The rates of rural unemployment being more or less the same as 8.49 per cent in 1972-73 and 8.11 per cent in 1977-78 refer to quite marginal improvement in employment in rural areas. The inter-state unemployment rates do not also present significant improvement in the situation of rural employment. In most of the States appeared in developed or semi-developed category, in terms of either development index or growth rates, show not only relatively high rates of unemployment but also refer to increase in the rates from 1972-73 to 1977-78.

The figures about the value of assets per household as given in Table 7 also tell the same story, so far the impact of agricultural growth on asset holding is concerned. Most of the developed States as appeared in the foregoing section show to have higher value of assets per household than that belonging to agriculturally backward States. They have also high concentration ratio. H. Laxminarayana's study (1979) shows that 'variation in assets per hectare across the States is directly related to variations in yield per hectare. This implies that the States having higher levels or rates of productivity increase have created more assets per hectare. The farm size-wise distribution of assets per hectare (and also

per household) across the States indicates that the farm households with large holdings have more assets than the other households. Thus inequalitarian pattern of land ownership and assets holding has favoured the process of growth and development in the interests of big farmers than in those of poor and unemployed in rural areas.

Conclusion

The process of growth in Indian agriculture was by and large fluctuating without retaining any reasonable level of stability in foodgrain productivity till 1964-65. But with the introduction of New Farm Technology since the mid-sixties, it presents a picture of growth with certain amount of stability in production. An overall picture presents a scene of relief in respect of growth in agricultural production.

But this process of growth has not been spatially uniform in Indian agriculture, as inter-state level of development and growth shows. The inter-state variations in the level of development and growth exist mostly due to inter-state differences in the development level of productive forces and in the degree of farmer's responsiveness to use these forces in the process of agricultural production.

Agricultural growth and anti-poverty programmes are supposed to bring about prosperity and progress in rural areas. But the extent of rural poverty, inequality level and unemployment rate indicate that agricultural growth and anti-poverty programmes

made
have little dent on the reduction of poverty, inequality and unemployment in rural areas. One may have this conclusion because of the existence highly skewed pattern of distribution of land and other material assets in rural India. Moreover, it becomes more difficult when the State functions in collusion with bureaucracy and rural oligarch in the absence of viable grass-root democratic institutions.

Appendix

Development Index (DI) is constructed as follows :

$$G.I. = \frac{\sum r_{yi} \cdot F_{ij}}{\sum r_{yi}} \times 100$$

Where :

G.I., is development index of i^{th} state;

r_{yi} is coefficient of correlation between yield at i^{th} indicator (variable); and,

F_{ij} is the ratio of i^{th} indicator in j^{th} state to national average

While constructing the above index, the following variables are into account :

1. Fertilizer consumption Kgs. per hectare
2. Area under HYV as per cent of total cropped area
3. Gross irrigated area as per cent of gross sown area
4. Number of tubewells per 1000 hectares of net sown area
5. Number of tractors per 10,000 hectares of net sown area
6. Cropping intensity
7. Net sown area as per cent of reporting area
8. Rural literacy rate
9. Area under commercial crops as per cent of gross sown area
10. Percentage of holding in less than 2 hectares
11. Percentage of area under less than 2 hectares
12. Number of scheduled commercial banks in rural areas as per cent of villages
13. Percentage of cultivators as members in cooperative societies to total cultivators

Productivity Index is constructed as follows :

$$G.I.j = \frac{\sum y_{ij} C_{ij}}{\sum C_{ij}} \times 100$$

Where,

G.I. is composite index of state j ;

C_{ij} is proportion of area under i^{th} crop to total cropped area in j^{th} state; and,

$y_{ij} = \frac{E_{ij}}{E_i}$ where E_{ij} is the yield of i^{th} crop in j^{th} state and E_i is the yield of i^{th} crop in the country as a whole.

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